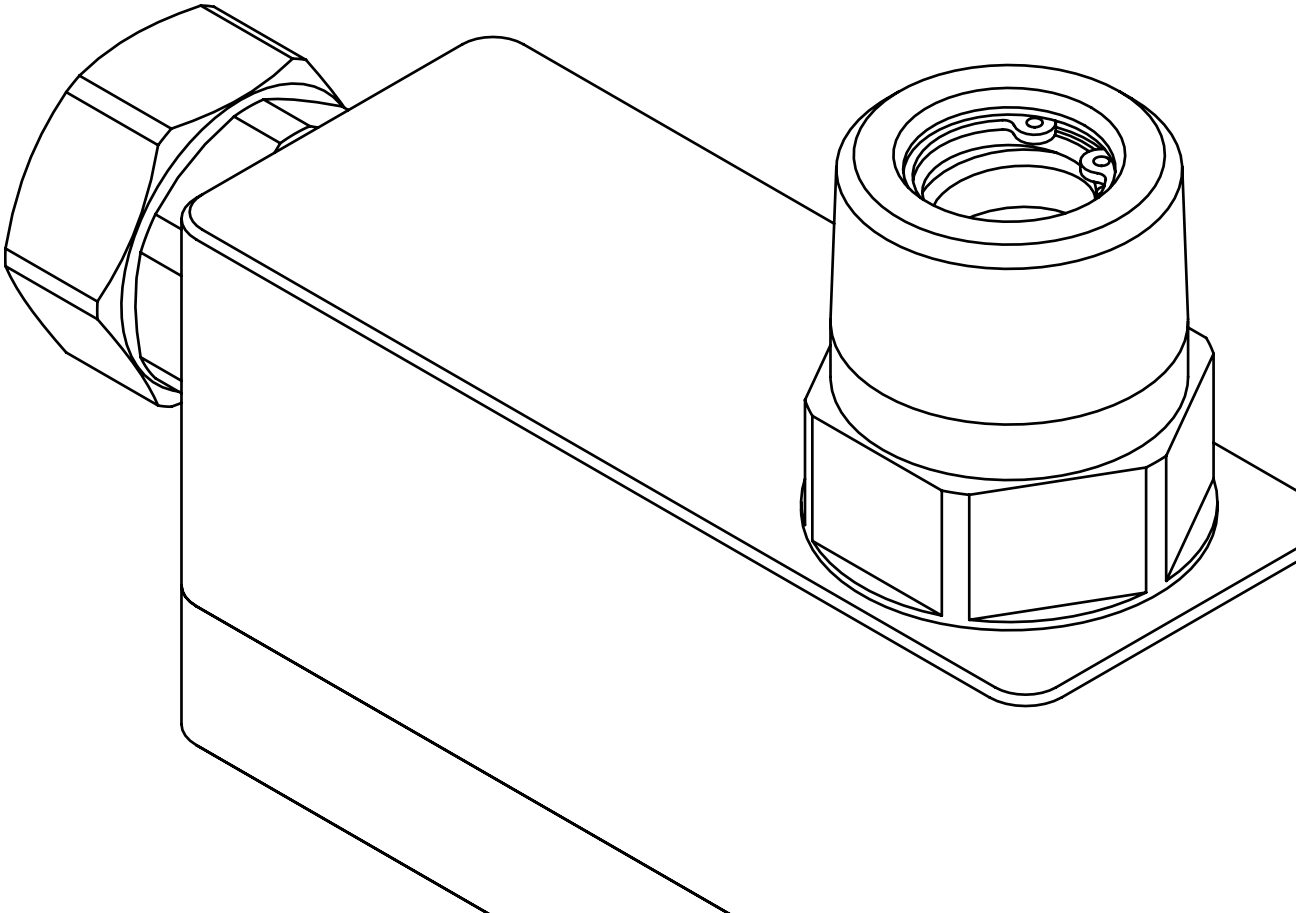
LineGuardian +DF™

USER/INSTALLATION MANUAL

LGS160806 / LGS080806
LGC160806 / LGC080806



Safety instructions

This is a professional grade product. Knowledge of construction techniques, fuel system installation and electrical installation according to codes are required for proper installation and user satisfaction. We recommend that a licensed certified contractor perform the installation of all Lorax Systems products. Our warranty does not cover improper installation related problems.

CAUTION:

When using this unit, basic precautions should always be performed, including the following:

- READ AND FOLLOW ALL INSTRUCTIONS. SAVE THESE INSTRUCTIONS.
- Use this unit only for its intended use as described in this manual.
- Please ensure proper tools are used as identified in this instruction manual.

WARNING:

- Do not tamper with user-operated controls or such devices.
- Cut ends of steel tubing are extremely sharp and can cause severe lacerations. Use stainless steel mesh gloves when handling. To assist, please use the guide caps provided to help minimize this danger.
- Use this unit only for its intended use as described in this manual.
- Use attachments which are recommended by the manufacturer only.

IMPORTANT:

- Read the complete instructions provided in this manual before beginning installation. For additional installation information please go to www.loraxsystems.com.
- Lorax Systems has obtained applicable listings generally available on a national basis for products of this type.
- It is the responsibility of the installer/owner to determine specific local code compliance prior to installation of the product. Lorax Systems makes no representation or warranty regarding, and will not be responsible for any code compliance. Product specifications are subject to change without notice.
- Save these instructions for future use.

Please use this form to record your model and serial number for future reference. Please keep this manual for future reference.

Date purchased _____

Purchased from _____

Installed by _____

Serial number _____

Model _____

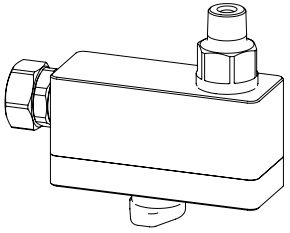
System overview

LineGuardian is a fire-safety mechanical valve that is designed to protect your property and the environment from an accidental or malicious release of fuel from a damaged or compromised fuel line connected to a fuel supply tank. LineGuardian continuously monitors the integrity of your fuel line and should it detect a problem, it will shut down the flow of fuel from the fuel tank immediately. Lorax Systems has acquired the appropriate certification listings for LineGuardian with CSA in the United States and UL in North America for this application.

LineGuardian is a significant step forward in improved fire-safety and fuel leak prevention technology for fuel oil consuming devices, and it includes a number of components that make it a complete system. There are three essential components to a fully operational LineGuardian installation.

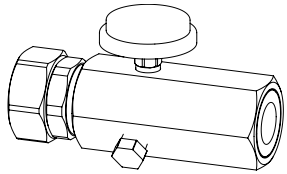
Required components

LINEGUARDIAN VALVE



The valve body attaches directly to the fuel tank outlet and can be oriented to any position. LineGuardian will reliably operate on any type of connection as required. You may require special adapter fittings in some cases, however, every possible effort has been made to ensure the components are standard and familiar for existing practices in the field.

TERMINATION FITTING



The LineGuardian system requires a termination fitting to complete the length of line being protected. The use of the Termination fitting is NOT optional. This fitting must be attached properly for the system to be considered installed and to provide the required protection. The termination fitting includes a Schrader fill valve for pre-charging the integrity monitor, a gauge to indicate the level of charge in the integrity monitor, and a fusible plug to automatically shut-off the flow of fuel from the tank in the event of a fire at the appliance.

PIPING

The tubing for the LineGuardian system includes a Lorax LineGuardian CSST (corrugated stainless steel tubing) outer pipe which is used for its strength and resistance to physical, environmental, and chemical influences. The inner pipe is a polyamide (composite) tube intended to carry the fuel to the appliance. The outer CSST surrounds this polyamide tubing providing protection from abnormal occurrences. The CSST also acts as a containment safety device in that it will hold fuel securely should the inner polyamide tube become compromised. The space between the two tubes (surveillance area) contains the pressurized charge of nitrogen to monitor the integrity of both tubes (inner and outer).

System installation requirements

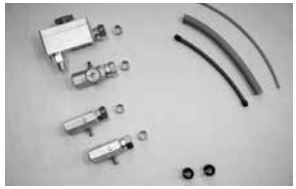
Before beginning installation, the tank should be securely installed in accordance with all local codes. If installing on a bottom/end tank, it is important that the tank is empty with all outlet fittings removed from the tank outlet (in the case of a retrofit). The tank outlet should present clean 1" NPT female threads (install an approved bushing, if necessary, using a certified non-hardening thread sealant suitable for fuel oil applications). Take appropriate measures to prevent and contain any oil that might drip from the outlet while unplugged.

Ensure that sufficient continuous lengths of 1/2" Lorax CSST and Lorax polyamide 3/8" tubing are available before beginning the installation. Use of any other tubing with this installation will void the certification and warranty of the system.

The installer must be familiar with the installation requirements for the Lorax products as detailed in the installation guide, and must also meet all qualifications and requirements to install fuel oil piping as required by the local administrative and code authorities.

LineGuardian One-Line System Components

Required tools



LineGuardian Two-Line System Components

In addition, the following tools and materials will be required:

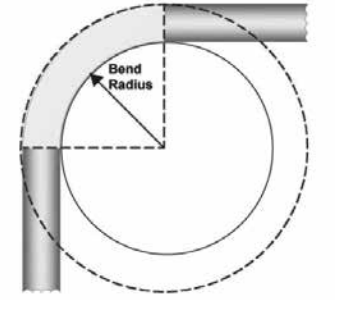
- Assortment of 3/4" tubing (or 1/2" CSST) clamps.
- Gas tight and oil resistant, UL listed thread sealant. (Not shown).
- Professional grade CSST cutter with sharp blade. Only use a cutter that is rated for stainless steel.
- Professional grade plastic tube cutter suitable for 3/8" diameter.
- Two open ended wrenches; one 1-1/8" and one 1-1/4".
- 1-1/4" diameter hole cutter (if wall and/or floor penetration is required). (not shown).
- Sharp utility knife with “roofing shingle” type hook blade.
- Good quality measuring tape.
- Fine-point permanent marker.
- Compressed Nitrogen (pressure regulator, hose, Schrader valve connector) (not shown)
- Two LineGuardian tube end guide tools (Included with valve kit).
- Electrical tape.
- Stainless steel mesh gloves. (Not shown).
- 1/8” allen key (long).

Piping / tubing considerations

- Precautions must be taken to ensure any exposed Lorax LineGuardian CSST is not damaged or abused.
- All piping/tubing, fittings and hardware should be stored in a clean, dry location prior to installation.
- Open ends of the piping/tubing are to be temporarily plugged or taped closed prior to installation to prevent entrance of dirt, dust or other debris.
- The protective gray plastic jacketing should be kept in place and undamaged to protect the tubing from corrosive threats. Contact with chemicals containing chlorides must be followed by a thorough rinse and wiped dry. This includes fluxes used to solder copper tubing and acid based cleaners used to wash masonry.
- Protect tubing from contact with sharp or heavy objects.
- Avoid stressing the tubing or fittings with tight bends, kinks, twists, stretching or repetitive bending. Refer to fig. 4-1 below for the recommended minimum bend radius for Lorax LineGuardian CSST.
- Lorax LineGuardian CSST shall be supported in a workmanlike manner with pipe straps, bands or hangers suitable for non-metalic contact of the CSST, at intervals not to exceed six feet vertical or horizontal. A proper support is one which is designed as a pipe hanger, does not damage the tubing during installation, and provides full support .
- “J” hooks shall NOT be used as they may damage the Lorax LineGuardian CSST. Zip ties/cable ties shall NOT be used as a primary support but may be used to organize or bundle Lorax CSST. When supporting Lorax LineGuardian CSST runs, the use of other conductive metallic systems such as metallic appliance vents,metallic ducting and piping, and electrical cables must be avoided.
- Lorax LineGuardian CSST must be rigidly terminated with a Lorax LineGuardian CSST termination fitting. This is achieved by terminating to a rigidly mounted connection point (i.e. appliance).
- Please see detailed instructions in the installation procedure section of this document for information regarding the proper handling and installation of the Lorax LG polyamide internal tubing.

FIGURE 4.1 – LG CSST AND POLYAMIDE MINIMUM BEND RADIUS

Part#	Tubing	Diameter	Minimum bend radius	System minimum bend radius
LG1-8	CSST	1/2"	3"	3"
LG2-6	Polyamide	3/8"	1.5"	



Step by step installation procedure

STEP 1: INSTALL VALVE

1 Carefully apply thread sealant to the external threads on the inlet of the LineGuardian valve (fig. 1) and install into the tank outlet using a wrench on the integrated nut flats.

2 Depending on the LineGuardian model being installed, it may be required to install a reducing bushing to complete the fitting of the LineGuardian valve (fig. 1). If the valve does not screw in by hand at least two and half turns, remove and check for damaged or contaminated threads (fig. 2).

3 Tighten (using a flat-jawed wrench on the integral nut flats) from two to three full turns past hand tight, stopping when the outlet is best oriented for the tube routing and accessibility (fig. 3).

fig. 1

fig. 2

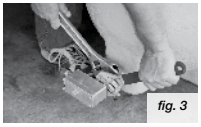


fig. 3

STEP 2: INSTALL TERMINATION FITTING

1 NOTE: All piping installed downstream of the termination fitting is NOT protected by the LineGuardian system.

2 Carefully apply thread sealant to the external threads of the nipple. Screw the LineGuardian termination fitting onto the nipple and tighten (using one flat jawed wrench and a pipe wrench) from two to three full turns. Orient so that the fill valve on the LineGuardian termination fitting is accessible and the gauge is visible.

3 At the appliance end of tubing, form the indoor stress loop at a suitable location if required by code or best practices.

4 ***Two-Line System Variance:*** install the #1 termination fitting at tank return-line inlet and the #2 termination fittings at fuel pump supply and return connections. Attach supplied ¼" plastic tubing (or copper substitute) to push connect tube fittings between the #2 termination fittings.

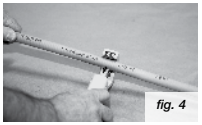


fig. 4

fig. 5

STEP 3: CUT LINEGUARDIAN CSST TUBING TO LENGTH

1 Generously estimate the total run length required to route flexible tube from tank outlet to appliance inlet.

2 ***Two-Line System Variance:*** also, estimate total run length for return-line termination fitting connections.

3 Base routing requirements on best practices for flexible oil line installation. Please ensure you adhere to all regulatory requirements for your jurisdiction.

4 Include approximately three extra feet for a stress loop at each end (if required).

5 Unroll and uncurl this length of 1/2" Lorax corrugated stainless steel tubing (CSST) by referring to the measurement markings on the tubing jacket.

6 Cut using a CSST cutter (fig. 4) leaving approximately one inch for fitting attachment. The cut should be centered between two corrugations and the result should be a clean and round cut end. Please note: when cutting CSST, ensure the section being cut is as straight as possible. Cutting on a bend or curve will render the newly cut ends unusable. To ensure a quality flare, all cuts should be made on a straight section of tubing.

7 Attach end guide tools on each end of CSST as shown in (fig. 5). Failure to attach these end fittings WILL result in damage to the Parflex tubing. If this occurs, you will need to replace all of the Parflex tubing.

STEP 4: CUT LG POLYAMIDE TUBING

1 Feed the capped 3/8" LG tubing through the length of the CSST (fig. 6).

2 Use a polyamide tube cutter (fig. 7) to cut the tube cleanly and squarely, such that at least 200 mm or 8" extend out each end of the CSST.

3 Leaving the end guide in place, use electrical tape (fig. 8) to seal around the polyamide tubing and CSST end cap, if they will need to be threaded through openings or areas with potential contamination. For an example of a suitable polyamide tube cutter, please see the next page (fig. 10).

fig. 6

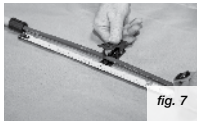


fig. 7

fig. 8

STEP 5: CONNECT TUBES AT THE VALVE

1 Remove the end guide from the tank end of the CSST (fig. 9).

2 Remove the brass nut from the outlet fitting on the LineGuardian valve being careful to collect and retain the two bushings (note that they are coated with a waxy lubricant and may be stuck inside the nut or on the tip of the remaining fitting). Take care to protect these components from contamination while exposed (fig. 11).

3 Using a utility knife, strip jacket back to the valley of the second corrugation (fig. 12). Do not cut the jacket in such a way that the sealing surface of the tubing is scored. The short piece of jacket can easily be removed by placing the utility knife blade under the jacket to peel the jacket off.

4 Place the nut over the end of the CSST (noting correct orientation), and position it at least 200 mm (8") from the end (fig. 13).

5 Insert the tank end of the polyamide tube fully into the inner fitting of the LineGuardian valve outlet. A full insertion will press beyond an initial resistance until it cannot press in further and cannot be withdrawn without the use of a special tool (fig. 14). NOTE: if the polyamide tube must be withdrawn after insertion, use a 1/8" allen key, to firmly depress the internal collet fitting, while simultaneously pushing the tube in firmly, and then pulling it out while the collet is still being depressed.

6 Separate bushings and position as shown (fig. 15) in the valley of the first corrugation leaving one corrugation exposed between the end of the bushing and tubing. The CSST bushing joint should NOT line up with the welded seam of the CSST tubing. Slide the nut back to the end to contain the bushings.

7 Pull the nut and CSST towards the LineGuardian valve. Insert brushings into fitting body. As small amount of resistance indicates the bushings are being compressed to further capture the jacket. NOTE: The piloting feature of the bushings ensures the tubing is aligned properly with the fitting body for a uniform flare and tight seal. Screw the nut onto the fitting, making sure not to cross threads (fig. 15). Do not tighten the CSST nut completely at this time. You will be using nitrogen to purge the lines before tightening this end of the installation. Please refer to step 8 for nitrogen purging procedure. NOTE: After purging with nitrogen, the CSST nut at the valve must now be fully and completely tightened. This means it must not be able to be tightened any further. If you are unsure of this instruction, please contact your sales rep or the manufacturer.

fig. 9

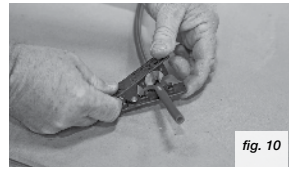


fig. 10

fig. 11

fig. 12

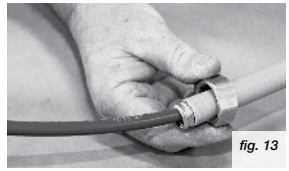


fig. 13

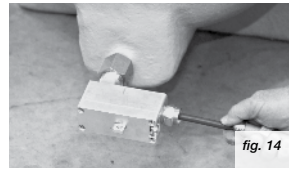


fig. 14

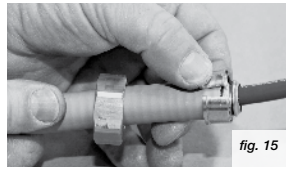


fig. 15

fig. 16

STEP 6: INSTALLING THE TUBING RUN

1 Form a stress relieving loop with a minimum 6" (150 mm) inside diameter at a convenient distance from the tank end of the line, if required.

2 NOTE: Lorax Systems recommends the use of a stress relieving loop at the tank connection end, however, it may not be required or recommended by local authorities and is dependent on installers best practices and jurisdictional requirements.

3 Route and secure the combined tubing from the tank outlet to the appliance inlet in accordance with industry best practices, and all regulatory and local compliance requirements.

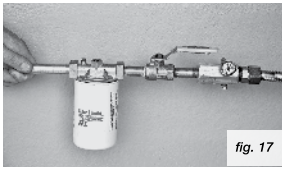


fig. 17

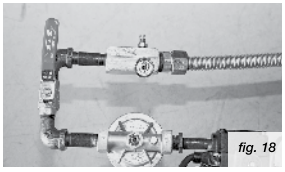


fig. 18

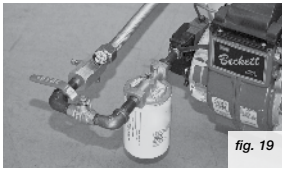


fig. 19

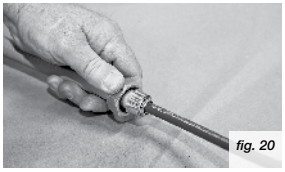


fig. 20

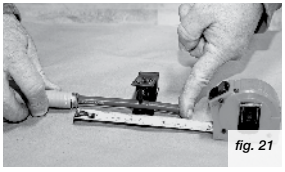


fig. 21

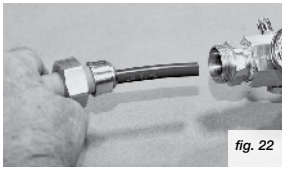


fig. 22

STEP 7: CONNECT TUBES AT APPLIANCE END

1 At the appliance end of tubing, form the indoor stress loop at a suitable location if required by code or best practices.

2 At the termination fitting, determine the required length and add an extra 8".

3 Cut the CSST and the polyamide tubing.

4 Insert the plastic sleeve supplied with the polyamide tubing and cut only the CSST to the required length.

5 Remove the CSST and plastic sleeve. The sleeve will protect the polyamide from being scratched by the sharp edges of the CSST.

6 Push the plastic sleeve back into the new end of the CSST.

7 Push the polyamide tube firmly back into the CSST and measure 3" from the end, mark and cut the poly tube.

8 Install the CSST nut in its proper orientation and remove the plastic sleeve.

9 Now push the polyamide tube firmly into the termination fitting until it bottoms out and pull on it to be sure it has locked into place.

10 Install the two split bushings in the last corrugation of the CSST and slide the nut over the bushings. Ensure that the joint of the split bushing DOES NOT line up with welded seam of the CSST.

11 Pull the nut ahead and install it onto the fitting and tighten using a 1-1/4" and a 1-1/8" wrenches. Tighten the nut until it bottoms out against the wrench hex on the fitting, this creates a double flare.

12 ***Two-Line System Variance:*** repeat steps 5, 6, and 7 to connect the return-line from the tank to appliance.

STEP 8: PURGE THE LINEGUARDIAN LINE WITH NITROGEN

1 CSST nut at LineGuardian valve should be loose (do not tighten).

2 Purge line with nitrogen at termination fitting Schrader valve for approximately 10 seconds. Nitrogen is used because it is a dry, inert gas with little change in volume due to temperature fluctuations.

3 Tighten CSST nut at LineGuardian valve. This completes the line purge. System is ready for charging.

STEP 9: CHARGE AND TEST SYSTEM

1 Using a compressed nitrogen canister, pressure regulator, hose and a Schrader valve fill fitting, inflate the system to 25 PSI using the fill valve on the termination fitting. Verify exact pressure with a precision pressure tester and replace cap on fill valve. Do not over pressurize.

2 Wait for one half hour and retest the pressure to ensure that there are no leaks. If pressure has dropped noticeably, first test CSST fittings with soap and water and retighten if necessary.

3 Once the system is pressure tight, the tank and line can be filled with oil normally. Note that there is a manual shut off valve located on the underside of the LineGuardian valve that will need to be opened.

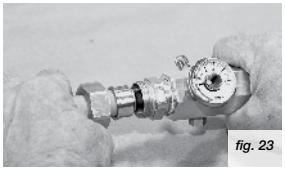


fig. 23

fig. 25

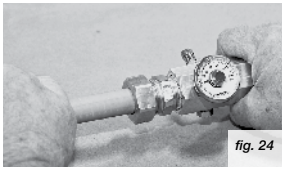


fig. 24

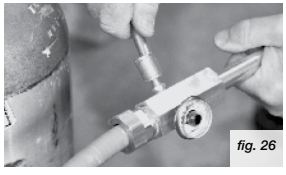


fig. 26

Verify the installation

1 ***Two-Line System Variance***: vacuum test cannot be performed on two-line system to verify installation. Recommend use of digital pressure gauge on Schrader valve to verify pressure is holding.

2 After installing the LineGuardian system and charging with nitrogen, install a vacuum gauge on the fuel pump inlet port or a “T” fitting installed at the fuel supply line inlet at the pump.

3 Check all external fittings with a soap test. Once the LineGuardian system is charged with nitrogen to 25 PSI, liberally spray all fittings (termination fitting; including Schrader valve, fusible plug, pressure gauge and CSST fitting and nut, and at the LineGuardian valve; including the manual valve, fusible plug, head bolts, CSST fitting and nut). Watch for any signs of foam around all connections. If no foaming is visible, wipe solution from fittings.

4 Open the manual valve at the tank and prime the oil burner fuel pump. If using a single line top feed fuel line, close the supply valve at the tank until a vacuum of at least 15" hg shows on the gauge, then open the valve quickly to remove any air trapped in the fuel line. Repeat this process until all of the air is removed and close the bleeder valve.

5 Start the oil burner and observe that the interstitial pressure remains stable on the termination fitting pressure gauge. Vacuum should be zero or close to it if proper syphon effect has been achieved.

6 With the oil burner running, close the manual valve at the tank. Open the bleeder valve at the fuel pump until a vacuum of 15 to 25" hg is acquired. Close the bleeder valve and turn the oil burner off.

7 Pressure and vacuum gauge readings should hold.

8 If there is a drop in pressure only, there is a surveillance gas (nitrogen) leak in the system.

Leaks of this nature can be from the CSST tubing itself or the external fittings on the valve or termination fitting. Fitting

leaks can be readily identified by performing a soap test on all fittings while the system is charged. Any fitting leak can usually be corrected by simply tightening. If a CSST connection continues to leak after tightening, remove the tubing and check the double flare on the tube-end for flaws. If the flare has been compromised, remove the internal fuel tubing from the connection, insert a plastic sleeve (tubing protector) into the CSST and cut the CSST back two inches. Cut the fuel tubing to the required length and inspect for any damage (nicks or scratches) on the tubing surface within the last inch of the tube-end. If tubing surface is smooth, re-install.

9 If there is a drop in pressure and vacuum there is an internal leak.

INTERNAL LEAKS CAN ONLY OCCUR IN THREE LOCATIONS:

i) At the fuel tubing connections: The first place to check for an internal leak is at the fuel tubing connection. A leak at the tube connection is normally caused by an improper seal between the tubing and the connection fitting inside the valve or termination fitting. Close the fuel valve at the supply tank and remove and inspect the tube for any damage. The last inch of tubing must not have any outer surface damage or it will not properly seal. If this is found to be the case, cut back the fuel tube and re-install as per previous instructions.

ii) In the fuel tubing: Unless severely damaged before or during installation inside of the CSST, or if a manufacturer's defect is identified, a fuel tubing leak is very rare. If suspected, remove the tubing from the CSST and replace it.

iii) Inside the valve: A leak inside the LineGuardian valve or termination fitting would be indicated if you are sure the fuel tubing is not compromised in any way at the tubing connections (see above). If this is the case, replace the valve first. If the leak continues, replace the termination fitting. If either of these replacements remedy the problem and if still under warranty, return the defective part to the place of purchase.

10 If there is a drop in vacuum only, the LineGuardian system is working correctly. However, there is a leak in the fuel pump or fittings between the termination fitting and the pump. Re-tighten all fittings on both the tank and fuel pump to eliminate the vacuum leak. If this does not resolve the problem there may be an issue with the fuel pump. Consult the fuel pump manufacturer's instructions to troubleshoot the leak.

Annual maintenance

LineGuardian is a safety system designed to respond to even the smallest of line leaks. LineGuardian should be inspected and maintained annually to ensure proper operation and performance.

ANNUAL MAINTENANCE OPERATIONS

1 Ensure system is active by checking pressure gauge at termination fitting. Pressure should be between 18 and 25 PSI.

2 Inspect system to ensure all components are in good working condition and secure.

3 Discharge the system surveillance gas at the termination fitting by releasing the nitrogen through the Schrader valve.

4 Once the nitrogen has been released, the automatic feature of LineGuardian has been activated, and the LineGuardian valve is now closed. The flow of fuel oil is now stopped.

5 Re-charge the LineGuardian system with nitrogen to 25 PSI. This step has re-opened the automatic valve. The flow of fuel oil is now active.

6 Ensure the nitrogen is maintained at a minimum of 22 PSI. If necessary, perform a "soap" test on connections to ensure there are no nitrogen (surveillance gas) leaks.

7 Exercise the manual valve by turning OFF and ON three consecutive times (RED handle on valve). Ensure that the manual valve is in good working condition. Ensure the manual valve is left in the ON position after exercising.

8 This completes the annual maintenance required for LineGuardian. If you have questions or concerns, please contact technical support as provided to you from your distributor.

Troubleshooting

PROBLEM	COMPONENTS	SUGGESTIONS
The system will not open and allow fuel to pass.	Fittings and valve connections	Check pressure gauge on termination fitting using a pressure tester, to ensure the proper pressure is being applied. If not, pressurize and evaluate.
The system seems to be losing nitrogen pressure.	Fittings and valve connections	Pressurize the system and perform a soap test on all fittings and joints in the system.
The system is holding nitrogen pressure, however, the fuel will not flow.	Valve	Check the manual valve located on the LineGuardian valve body and ensure it is in the open position. Ensure that the fuel system is holding a vacuum. Check all external fittings and the fuel pump.
The system seems to be losing nitrogen pressure slowly. Eventually the valve closes and stops the fuel.	All components	This problem usually indicates there was a problem installing the polyamide tubing during installation. You should verify with a soap test that no fittings or joints are leaking. You may need to redo the polyamide connections at one or both ends of the system. Close valve at tank and perform vacuum test.
The pressure gauge on the termination fitting seems to indicate different pressures at different times.	All components	Although the pressure applied is enough to open the LineGuardian valve, if the temperature drops, the pressure will drop as well. Check for leaks by performing a soap test. If no issues are found after the soap test, then it may simply be a symptom of the lower temperatures. If the LineGuardian valve is closed, add more nitrogen to open.
The system will not charge with nitrogen.	All components	Perform soap test. If need be, replace the Schrader valve on the termination fitting.

Troubleshooting

SCENARIO	INTERSTITIAL PRESSURE (NITROGEN)	FUEL LINE VACUUM	COMMENTS/ACTION REQUIRED
1	✓	✓	Correct installation, system is fully operational
2	✓	✗	LineGuardian system is functioning correctly, but there is a vacuum leak in one of the external fittings. Check fuel fittings at the tank and burner, as well as the fuel pump for vacuum leaks (see #9 in “Verifying the Installation”)
3	✗	✓	There is a nitrogen gas leak within the system. Check CSST and fittings for leaks using a soap test. Retighten all fittings and if necessary re-install to remedy the situation (see #7, in “Verifying the Installation”).
4	✗	✗	There is an internal leak within the LineGuardian system. Check the polyamide fuel line for damage or imperfections, as well as all connection points to ensure a proper seal is made to both the valve and termination fitting (see #8, in “Verifying the Installation”).

LineGuardian+DF™

LIMITED WARRANTY FOR LORAX SYSTEMS INC. LINEGUARDIAN

(i) LORAX Systems Inc. ("Lorax") warrants to persons (the "Buyer") who purchase its LineGuardian Systems (the "Products") that the Products are free from defects in material and workmanship and conform to the specifications published by Lorax.

(ii) The provisions of this warranty extend to the Products, when used in accordance with operational instructions within the tolerances of Lorax's product specifications and unless otherwise specified in writing by Lorax, for the following periods:

- LineGuardian valve system – 5 years from the date of manufacture by Lorax; and
- Fuel lines – 1 year from the date of delivery.

(iii) The Buyer must provide written notice of any claim of breach of warranty to Lorax within the warranty period described above.

(iv) Lorax will not be liable for any special or consequential damages as a result of a breach of this warranty. Lorax's sole obligation in the event of a breach of this warranty will be, at Lorax's sole discretion, to either issue a credit, or repair or replace any Products that are proven to be defective.

(v) The LineGuardian valve is designed to trigger when a leak is detected or for other safety reasons, and the reason for such trigger may either make the valve unusable or require qualified service for reinstallation. In the event the valve is triggered for any reason, Lorax will not be liable for repair or replacement of the Products or any components used with the Products.

(vi) Any replacement Products that Lorax provides to the Buyer will be subject to the warranty period of the Product originally purchased by the Buyer.

(vii) Lorax will not reimburse or compensate the Buyer for any transportation, duties, brokerage fees, labor costs, or parts adjustments or repairs, or any other work, unless Lorax has authorized such costs in advance in writing.

(viii) This warranty will not apply to Products subjected to misuse, neglect, alteration, accident, improper care after installation or any chemical, electrical or physical abuse, nor to Products not properly installed by a qualified, competent technician who is licensed as may be required in the jurisdiction where the Product is installed and who is experienced in making such installations.

(ix) The Buyer is responsible to provide suitable monitoring and/or backup systems to prevent damage or inconvenience due to product shutdown or failure, and failure to implement such systems will constitute misuse or neglect by the buyer.

(x) The Buyer is responsible to determine whether the Products are suitable for the Buyer's or any third-party's intended use or application, including, but not limited to reviewing the published specifications, testing the Products and ensuring that the design of the Products is suitable for the Buyer's intended use.

(xi) This warranty is limited to the precise terms set out above and provides exclusive remedies expressly in lieu of all other remedies.

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